

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 (withdrawn): A method for producing a light emitting diode, which has a plated substrate with a mirror, comprising steps of:

- a) providing a substrate with an LED epitaxial structure including a second cladding layer, an active layer, a first cladding layer, a window and a metal contact layer sequentially formed on said substrate;
- b) etching a part of said LED epitaxial structure to expose said second cladding layer;
- c) forming a first electrode and a second electrode respectively on said metal contact layer and said exposed second cladding layer, and heating both said electrodes by rapid thermal annealing;
- d) bonding a temporary substrate to said LED epitaxial structure and said first electrode;
- e) removing said substrate provided in step a);
- f) forming a mirror beneath said LED epitaxial structure;
- g) plating a permanent substrate beneath said mirror; and
- h) removing said temporary substrate.

Claims 2 (withdrawn): The method as claimed in claim 1, wherein said substrate provided in step a) is a GaAs substrate, a sapphire substrate or an InP substrate.

Claims 3 (withdrawn): The method as claimed in claim 1, wherein said LED epitaxial structure is made from a material selected from the group consisting of $\text{Ga}_x\text{Al}_y\text{In}_{1-x-y}\text{N}$, $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$, $\text{In}_x\text{Ga}_{1-x}\text{As}$, $\text{ZnS}_x\text{Se}_{1-x}$; wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$.

Claims 4 (withdrawn): The method as claimed in claim 1, wherein said metal contact layer is partially etched to retain a portion beneath said first electrode.

Claims 5 (withdrawn): The method as claimed in claim 1 further depositing a transparent conductive film between said first electrode and said metal contact layer.

Claims 6 (withdrawn): The method as claimed in claim 1, wherein said temporary substrate is a glass substrate.

Claims 7 (withdrawn): The method as claimed in claim 1, wherein said temporary substrate is bonded to said LED epitaxial structure with epoxy or wax.

Claims 8 (withdrawn): The method as claimed in claim 1, wherein said mirror is a metal capable of forming high bandgap with said LED epitaxial structure.

Claims 9 (withdrawn): The method as claimed in claim 8, wherein said mirror is made from a material selected from the group consisting of Ag, Pt, Pd, Au, Au/Zn, Au/Be, Au/Ge, Au/Ge/Ni, In, Sn, Al, Zn, Ge and Ni, or mixtures thereof.

Claims 10 (withdrawn): The method as claimed in claim 1, wherein said mirror is made from a composite of a metal with a low refractivity and an insulating layer with a high refractivity, and said insulating layer is adjacent to said LED epitaxial structure.

Claims 11 (withdrawn): The method as claimed in claim 10, wherein said composite is selected from the group consisting of Al/Al₂O₃, Al/SiO₂, Al/MgF₂, Pt/Al₂O₃, Pt/SiO₂, Pt/MgF₂, Al/Al₂O₃, Al/SiO₂, Al/MgF₂, Au/Al₂O₃, Au/SiO₂, Au/MgF₂, Ag/Al₂O₃, Ag/SiO₂ and Ag/MgF₂.

Claims 12 (withdrawn): The method as claimed in claim 1, wherein said permanent substrate is plated beneath said mirror other than predetermined saw streets.

Claim 13 (original): A light emitting diode having a plated substrate with a mirror, comprising:

an LED epitaxial structure sequentially comprising a second cladding layer, an active layer, a first cladding layer, a window and a metal contact layer,

wherein said second cladding layer is partially exposed;
a first electrode formed on said metal contact layer;
a second electrode formed on said exposed second cladding layer;
a mirror formed beneath said LED epitaxial structure; and
a permanent metal substrate plated beneath said mirror after completing
the first and second electrodes.

Claim 14 (original): The light emitting diode as claimed in claim 13, wherein said LED epitaxial structure is made from a material selected from the group consisting of $\text{Ga}_x\text{Al}_y\text{In}_{1-x-y}\text{N}$, $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$, $\text{In}_x\text{Ga}_{1-x}\text{As}$, $\text{ZnS}_x\text{Se}_{1-x}$; wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$.

Claim 15 (original): The light emitting diode as claimed in claim 13 further comprising a transparent conductive film between said first electrode and said metal contact layer.

Claims 16-17 (canceled)

Claim 18 (original): The light emitting diode as claimed in claim 13, wherein said mirror is made from a composite of a metal with a low refractivity and an insulating layer with a high refractivity, and said insulating layer is adjacent to said LED epitaxial structure.

Claim 19 (original): The light emitting diode as claimed in claim 18, wherein said composite is selected from the group consisting of $\text{Al}/\text{Al}_2\text{O}_3$, Al/SiO_2 , Al/MgF_2 , $\text{Pt}/\text{Al}_2\text{O}_3$, Pt/SiO_2 , Pt/MgF_2 , $\text{Al}/\text{Al}_2\text{O}_3$, Al/SiO_2 , Al/MgF_2 , $\text{Au}/\text{Al}_2\text{O}_3$, Au/SiO_2 , Au/MgF_2 , $\text{Ag}/\text{Al}_2\text{O}_3$, Ag/SiO_2 , Ag/MgF_2 .

Claim 20 (original): The light emitting diode as claimed in claim 14, wherein said LED epitaxial structure is made from $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$; wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$; and said mirror is made from a material selected from the group consisting of Ag, Au, Au/Zn, Au/Be, Au/Ge, Au/Ge/Ni and Zn, or mixtures thereof.

Claim 21 (original): The light emitting diode as claimed in claim 13, wherein said LED epitaxial structure is made from $\text{Ga}_x\text{Al}_y\text{In}_{1-x-y}\text{N}$; wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$; and said mirror is made from a material selected from the group consisting of Ag, Pt, Pd, Al, and Ni, or mixtures thereof.

Claim 22 (original): The light emitting diode as claimed in claim 13, wherein said LED epitaxial structure is made from $\text{In}_x\text{Ga}_{1-x}\text{As}$; wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$; and said mirror is made from a material selected from the group consisting of Ag, Au, Au/Zn, Au/Be, Au/Ge, Au/Ge/Ni and Zn, or mixtures thereof.

Claim 23 (original): The light emitting diode as claimed in claim 13, wherein said LED epitaxial structure is made from $\text{ZnS}_x\text{Se}_{1-x}$; wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$; and said mirror is made from a material selected from the group consisting of Ag, Pt, Pd, Au/Zn, Au/Be, Au/Ge, Au/Ge/Ni, Al and Ni, or mixtures thereof.

Claim 24 (original): The light emitting diode as claimed in claim 13, wherein said LED epitaxial structure is made from $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$; wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$, and said mirror is made from Ag.

Claim 24 (original): The light emitting diode as claimed in claim 13, wherein said LED epitaxial structure is made from $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$; wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$, and said mirror is made from Ag.

Claim 25 (original): The light emitting diode as claimed in claim 13, wherein said LED epitaxial structure is made from $(\text{Al}_x\text{Ga}_{1-x})_y\text{In}_{1-y}\text{P}$; wherein $0 \leq x \leq 1$, $0 \leq y \leq 1$, and said mirror is made from a composite of Al/Al₂O₃.